term time shall be the minimum during two terms for each lecturer receiving 50*l.* per annum. As far as possible the University Lecturers are to give special personal attention to their pupils, so as to obviate as much as possible the necessity of private tuition in the subject of the lectures; and the students' fees are to be understood as payment for this personal supervision.

The Special Board for Biology and Geology have published a report showing urgent need for a Senior Demonstrator in Elementary Biology and Animal Morphology at 200*l.* a year; the classes have grown enormously, consequent on recent changes in the M.B. examinations. They recommend that the Lecturers, by whose aid Mr. Sedgwick carries on the work of the late Prof. Balfour, shall be appointed University Lecturers, Dr. Hans Gadow in the Advanced Morphology of Vertebrates, and Mr. W. F. R. Weldon in that of Invertebrates. Moreover, they consider an Assistant Demonstrator as well as other occasional demonstrators are required.

Prof. Hughes has written a letter on the subject of the proposed Sedgwick Museum, suggesting that educational utility rather than architectural display should be the principal aim in the building, and pleading strongly against possible curtailment of the site available for the new museum to satisfy demands of other departments. The area now proposed, 240 feet by 50 feet, with room behind for future extension by annexes, &c., is not too large. If sufficient space can be secured for future extension, it is best to place the museum entirely on one floor; but if this is not certain, it would be desirable to have two long rooms one above another, each 20 feet high.

SCIENTIFIC SERIALS

THE *Quarterly Journal of Microscopical Science* for January, 1884, contains:—Notes on Echinoderm morphology, No. vii.: on the apical system of the Ophiurids, by P. Herbert Carpenter, M.A. (plate 1).—On the homologies of the primary larval plates in the test of Brachiate Echinoderms, by W. Percy Sladen (plate 1).—On the origin of metameric segmentation and some other morphological questions, by Adam Sedgwick, M.A. (plates 2 and 3).—On certain abnormalities in the common frog (*Rana temporaria*): (1) the occurrence of an ovotestis; (2) abnormalities of the vertebral column, by A. Gibbs Bourne, B.Sc. (plate 4).—Researches on the intracellular digestion of Invertebrates, by Dr. E. Metschnikoff (translated from *Arbeiten Zool. Instit. Wien*, 1883.—On the ancestral history of the inflammatory process, by Dr. E. Metschnikoff.—The structures connected with the ovarian ovum of Marsupialia and Monotremata, by Edward B. Poulton, M.A. (plate 5).—On the skeletotrophic tissues and coxal glands of Limulus, Scorpio, and Mygale, by Prof. E. Ray Lankester, M.A. (plates 6 to 11).

THE *Journal of Physiology*, vol. iv., No. 6, February, 1884, contains:—On the electrical phenomena of the excitatory process in the heart of the frog and of the tortoise as investigated photographically, by Dr. J. Burdon-Sanderson and F. J. M. Page (plates 13 to 20).—Experiments on the ears of fishes with reference to the function of equilibrium, by Dr. Henry Sewall.—On the influence of certain drugs on the period of diminished excitability, by Dr. S. Ringer and Dr. H. Sainsbury (plate 21).—On the action of digitalis, by Dr. J. Blake.—On the coagulation of the blood, by L. C. Wooldridge, D.Sc.—An investigation regarding the action of rubidium and cæsium salts compared with the action of potassium salts on the ventricle of the frog's heart, by Dr. S. Ringer (plate 22).—Some notes on the fibrin ferment, by S. Lea, M.A., and J. R. Green, B.Sc.

THE *Journal of the Royal Microscopical Society*, February, 1884, contains:—On the constituents of sewage in the mud of the Thames, by Lionel S. Beale, F.R.S. (plates 1 to 4).—On the modes of vision with objectives of wide aperture, by Prof. E. Abbe (figures); and the usual summary of current researches relating to zoology and botany.

Morphologisches Jahrbuch, Bd. ix., Heft 11, contains:—On the comparative anatomy of the excretory sexual organs of insects, by J. A. Palmen.—Contributions to the comparative anatomy of fishes, No. i.; on the cranium of *Amia calva*, L., by Dr. M. Sagemehl (plate 10).—A contribution to a knowledge of the pseudobranchiæ in osseous fishes, by Dr. F. Maurer (plates 11 and 12).—On the morphology of the mammalian teat, by Hermann Klaatsch (plates 13 to 17).

Archives Italiennes de Biologie, tome iv., fasc. 11, December 15, 1883, contains:—New researches on the alterations in organs in diabetes, by Dr. P. Ferraro.—New researches on the normal and pathological anatomy of the human placenta and of that of mammals, being the substance of three letters to Prof. Albert Kölliker, by Dr. G. B. Ercolani.—On the ciliary muscle in reptiles, by Dr. Ferruccio Mercanti.—On the reproduction of epithelium of the anterior crystalline capsule in adult animals under normal and pathological conditions, by Dr. F. Falchi.—On some dangers from fly's excrement, by Dr. B. Grassi.—On the course and termination of the optic nerve in the retina of a crocodile (*Champsa lucius*), by Dr. A. Tafani (with a plate).—On the development of the vertebral column in osseous fishes, by Dr. B. Grassi.—Notice of the death and writings of Dr. P. Burresi, and of the death of Prof. G. B. Ercolani of Bologna.

Rivista Scientifico-Industriale, *Florence*, January 15.—A description, with illustration, of the seismoscopic clock invented by Brassart Brothers, by E. Brassart.—On the harmonic sounds produced by a fluid discharged through a tube, by Tito Martini.—Variations in the electric resistance of solid and pure metallic wires under varying temperatures; Part i., Historic survey of the works hitherto issued on the influence of temperature on the conductibility and electric resistance of solid and pure metals, by Prof. Angelo Emo.—Account of the semi-incandescent electric lamp invented by Tihon.—A practical application of Newton's rings in motion, by Prof. Augusto Righi.—On the periodical migrations of the *Myosus glis*, Gml., by S. Mina-Palumbo.—On the nest of the *Geophilus flavus*, by Prof. F. Fanzago.—On the mollusks at present inhabiting the province of Porto-Maurizio, Maritime Alps, by G. R. Sulliotti.

Rendiconti del Reale Istituto Lombardo, February 7.—Obituary notice of Prof. Emilio Cornalia (concluded), by Prof. Leopoldo Maggi.—A short description of the crystals of barium found at Vernasca, by Dr. F. Sansoni.—On the importance of certain symptoms in the diagnosis of sciatica and other affections of the hip, by Dr. G. Fiorani.—Whether women should be permitted to follow the legal profession, by Prof. E. Vidari.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, March 13.—"Notes on the Microscopic Structure of some Rocks from the Andes of Ecuador, collected by Edward Whymper. No. II. Antisana." By Prof. T. G. Bonney, D.Sc., F.R.S.

The specimens examined consisted of one series gathered by Mr. Whymper and another obtained by him from a collector. The latter came from the south-west or west side of the mountain, at elevations probably not exceeding 13,000 feet. Among them are pitchstones and augite-andesites, in which a little hypersthene possibly occurs. Mr. Whymper's own collection contains specimens of the great lava stream on the west side of Antisana, taken at about 12,340 feet above the sea. It is an augite andesite. The remainder represents the rocks forming the upper part of the mountain, collected from a moraine about 16,000 feet above the sea, supplied by occasional crags, which crop out through the snow and are mostly inaccessible. These are a series of augite-andesites, in some of which hypersthene is certainly present.

Linnean Society, March 20.—H. T. Stainton, F.R.S., vice-president, in the chair.—The Rev. Canon Jas. Baker, Mr. W. Brockbank, Mr. Robert Mason, and Mr. Ed. A. Heath were elected Fellows of the Society.—Mr. J. G. Baker showed and made remarks on a supposed hybrid between the Oxlip (*Primula elatior*) and the Cowslip (*P. veris*).—In illustration of his paper, a contribution to the knowledge of the genus *Anaphe*, Walker, Lord Walsingham exhibited a large and remarkable nest containing a packed mass of cocoons, also specimens of the insects and of the larvæ of a species of Congregating Moth of this genus from Natal; and he likewise showed a live example of a dipterous parasite which had emerged from the moth's eggs when hatched. He further stated that the nest and contents had been forwarded to him by Col. Bowker of Durban, and the larvæ were found alive on its receipt in England in August last. Many of the larvæ remained in the nest, but others in companies of twenty to forty occasionally marched out, moving in closely serried rank, much after the manner of the larvæ of the Procession Moth (*Cnethocampa*). From December to February about 250 moths emerged, but, from the difficulty of obtaining their natural food, all died, though a pair bred and the eggs hatched.

The mature insect closely resembles the *Anaphe panda*, Boisd., though under the latter name, it would seem, there are several well-marked local races. The genus is found in West Africa as well as Natal; and it appears that in the several species the colour, size, shape, and material of the common nest, as well as the individual silky cocoons, markedly differ. The habits of these moths when still more fully known in their native haunts will yet form a most interesting chapter to the traveller. Of *Anaphe* four species have hitherto been described, viz. *A. venata* from Old Calabar, *A. ambigua* from Angola, and *A. reticulata* and *A. panda* from Natal. To these Lord Walsingham adds *A. carteri* from the Gold Coast, and *A. infracta* from the Cameroons.—A paper, on the hairs occurring on the stamens of plants, by Mr. Greenwood Pim, was read. As to the morphology of these he sums up the groups thus: (1) simple unicellular, subulate, smooth, *Malva, Campanula;* (2) unicellular, subulate, rugose or papillar, *Cuphea, Nerium, Eutoca;* (3) unicellular, flattened, spathulate, rugose or striate, *Verbascum, Celsia, Antirrhinum;* (4) pluricellular, simple, smooth, *Salvia, Adhatoda;* (5) pluricellular, simple, rugose or striate, *Anagallis, Thunbergia;* (6) pluricellular and branched, *Browallia* and some forms of *Salvia;* (7) pluricellular with glandular tip, *Oxalis, Gesnera;* (8) multicellular, *Convolvulus, Ipomœa.*—A communication was read, "Closure of the Cyclostomatous Bryozoa," by Arthur W. Waters. While admitting that the group possesses few characters available for purposes of scientific determination, he nevertheless points out that the ovicells have a greater importance than that hitherto accorded them; also that the connecting pores are comparable with the rosette plates of the Chilostomata, and that stress must be laid on the size of the zooecial tube, and more particularly to the position and variation of its closure. The author states that in the Cyclostomata (simplest Bryozoa) he has found a calcareous partition closing the tubular zooecium, thus protecting the colony; whereas in the Chilostomata there is a horny operculum, which, unlike the other, is not a sign of death, but, being movable, protects the living polypide, and through it the colony.—A paper was read on the life-history of *Æcidium bellidis*, by Mr. C. B. Plowright, in which he gives the results of a series of experiments, noting the infection and appearance of the Uredo. He differs in opinion from most authorities, who regard the *Æcidium* of the daisy as a variety of *Æ. compositarum*, while he demonstrates it to be a true heterœcismal Uredine.—The last communication read was by Mr. F. Kitton, on some Diatomaceæ from the Island of Socotra, in which a number of new species are described and figured.

Geological Society, March 5.—Prof. T. G. Bonney, F.R.S., president, in the chair.—F. N. Maude, John Potts, and Corbet Woodall were elected Fellows, and Dr. Charles Barrois, of Lille, a Foreign Correspondent of the Society.—The following communications were read:—On the structure and formation of coal, by E. Wethered, F.G.S., F.C.S. The conclusions on the evidence elicited from the author's investigations were (1) that some coals were practically made up of spores, others were not, these variations often occurring in the beds of the same seam; (2) the so-called bituminous coals were largely made up of the substance which the author termed hydrocarbon, to which wood-tissue undoubtedly contributed. An appendix to the paper, written by Prof. Harker, Professor of Botany and Geology at the Royal Agricultural College, Cirencester, dealt with the determination of the spores seen in Mr. Wethered's microscopic sections. The writer concluded that the forms in the coal were from a group of plants having affinities with the modern genus *Isoëtes*, and from this Isoëtoid character he suggests the generic title of *Isoëtoides* pending further investigation.—On strain in connection with crystallisation and the development of perlitic structure, by Frank Rutley, F.G.S.—Sketches of South-African geology; No. 1, a sketch of the high-level coal-field of South Africa, by W. H. Penning, F.G.S. In this paper the author gave a sketch of the high-level coal-field of the Transvaal and the neighbouring region. This coal-field was described as extending 400 miles from north to south, with an average breadth of 140 miles, so that its area is about 56,000 square miles. The tract consists of an elevated plateau forming the "High Veldts" of the Transvaal and the plains of the Orange Free State. It slopes away to the north-west, and is scarped to the south and east by the heights known as the Stormberg and Drakensberg Mountains; nearly all the principal rivers of South Africa take their rise in this tract of land. The coal-bearing beds forming the plateau rest unconformably in the north upon deposits probably of Upper Palæozoic age, described as the Megalieisberg beds. In the south-west the Lower Karoo beds underlie the coal-beds, also unconformably. The beds of the high grounds consist above of sandstones, called the "High Veldt beds" by the author, and below of shales, for which the name of "Kimberley beds" is proposed, after the chief town of Griqualand West, in which district they form nearly the whole surface. These two series are conformable, and generally lie horizontally. In the shales coal occurs only in minute patches; the seams of coal are interstratified with the sandstones, into which the shales pass up gradually, and which sometimes include thick-bedded grits and conglomerates. Both shales and sandstones contain interstratifications and numerous dykes of trap, which have rarely produced much alteration in the sedimentary beds, from which the author concludes that the eruptions were sub-aqueous and contemporaneous, or nearly so. Owing to the persistent horizontality of the rocks, the mountains and valleys are merely carved out of the plateau, so that the thickness of the deposits is easily measured. The author gave 2300 feet as the minimum thickness of each series. By a comparative section it was shown that the coal-bearing sandstones ("High Veldt beds") are the "Upper Karoo" of Stow, and the "Stormberg beds" of Dunn. The "Kimberley beds" are the Upper Karoo beds of Dunn. In the latter part of his paper the author noticed briefly the different localities where coal has been found, namely, Newcastle, Lange's Nek, the Lebelelasberg Mountains, near New Scotland, several places on the High Veldt, Wemburg, Brandfoote, Cornet Spruit, Burgersdorf, and Indwe, twenty miles east of Dordrecht. The most northerly point of the Transvaal where coal has been found is on the Letsebo River. West of the Drakensberg coal occurs at a lower level.

Entomological Society, March 5.—Special General Meeting.—Mr. J. W. Dunning, president, in the chair.—Prof. J. O. Westwood, hon. life president, proposed, and Mr. H. T. Stainton seconded, a proposition "That it is desirable to obtain for the Society a Royal Charter of Incorporation." After a short discussion, the resolution was carried *nem. con.*

Ordinary Meeting.—Prof. Westwood, hon. life president, in the chair.—Two new members were elected.—Mr. E. A. Fitch exhibited a large geodephagous larva said to have been coughed up at Maldon by a young man who was suffering from bronchitis.—Mr. J. W. Dunning protested against the irregular manner in which the names of persons had lately been used in entomological nomenclature; and Mr. H. J. Elwes expressed his disapproval of the use of Hindoo mythological, and other names not of Latin or Greek derivation, in the same manner.—Mr. E. Saunders read the concluding part of his synopsis of the British *Hymenoptera Aculeata*, part iii. *Apidæ;* and also, further notes on the terminal segments of aculeate *Hymenoptera*.

EDINBURGH

Mathematical Society, March 14.—A. J. G. Barclay, vice-president, in the chair.—Mr. W. J. Macdonald gave an account of Pascal's "Essais pour les Coniques."—Mr. R. E. Allardice read a paper on the geometry of the spherical surface; and Prof. Chrystal gave an additional proof of one of his theorems.—Mr. Thomas Muir, F.R.S.E., contributed a note on the condensation of a special continuant.

Royal Physical Society, March 19.—Mr. B. W. Peach, F.R.S.E., F.G.S., president, in the chair.—The following communications were read:—Notes on a second collection of birds and eggs from Central Uruguay (with exhibition of specimens), by Mr. J. J. Dalgleish.—On a revised list of British *Ophiuroidea*, by W. E. Hoyle, M.A., F.R.S.E., of the *Challenger* Expedition Office.—On the Breadalbane Mines, by Messrs. J. S. Grant Wilson and H. M. Cadell, B.Sc., of H.M. Geological Survey of Scotland (communicated by permission of the Director-General of the Geological Survey). These mines are situated in the basin of the Tay, and the highest—those of Tyndrum—were first noticed. The galena veins were partly in a fissure traversing the quartzites in close proximity to a large fault which the authors had observed for the first time at Tyndrum. Another vein existed in the fault fissure itself or in the mica schists which were brought down by it against the quartzites. A difference in inclination brought the two fissures together, and at a certain depth they found a conjoint vein. Below the line of junction the ore almost disappeared, as had been proved by the old workings, and very little ore was visible in the portion of the conjoint vein exposed on the surface. The veins were of quartz with spathic iron and barytes,

and were never more than four feet in thickness. The ore was distributed in broad rudely parallel diagonal bands, and the veins resembled in this as in other particulars those of the Upper Harz belonging to von Groddeck's "Type Clausthal." Lead ore was discovered at Tyndrum in 1741, and was mined with varying activity till 1862, when the mines were abandoned, as they had quite ceased to pay expenses. Chrome iron ore was known to occur in considerable quantity in a mass of serpentine at Coirie Charnaig in Glen Lochaig, but had never been extensively worked. An interesting occurrence of grey and yellow copper ore was found at Tomnadashan on the southern shore of Loch Tay. The ore was disseminated through a mass of crystalline rock resembling diorite, which had been injected into the schists, hardening and contorting them at its edges. The basic rock was in turn traversed by multitudes of veins of pink granitite, which at some places united and formed a stock-like mass with large pink orthoclase crystals. The ore was found most abundantly at the junction of the two rocks. Molybden glance occurred in the acid rock, but no traces of blende or galena had been discovered at Tomnadashan. At Corrai Bui near Ardeonaig rich argentiferous galena veins traversed the schists on the top of a hill which was capped by a series of calcareous beds. The galena contained from 85 to 600 ounces of silver per ton of ore, but the veins thinned out on passing down into the non-calcareous beds below, and became quite barren at a depth of 100 feet. There were many other very thin veins of pyrites, blende, galena, &c., in the Breadalbane district, but none were thick enough to be worked with profit.—Prof. Cossar Ewart, F.R.S.E., exhibited, with remarks, the following specimens:—(1) the Tadpole fish (*Raniceps trifurens*); (2) the Great Fork-beard (*Phycis blenniodes*); (3) the Power Cod (*Gadus minutus*); (4) an Albino specimen of the Haddock (*Gadus æglefinus*).—Prof. Ewart also exhibited and described a new hatching-box he had devised for adhesive eggs to take the place of the American "Clark" hatching-box. The advantage of Prof. Ewart's box is that the glasses are arranged in a horizontal position, so that the embryos, when hatched, pass at once into comparatively still water, instead of having to run over and under a varying number of vertical glass plates.—Prof. Ewart also described an easy method of stocking spawning beds capable of being readily used by the fishermen themselves. All that was required was an ordinary wooden tub and a shallow galvanised iron tray about twenty inches in diameter, with the bottom consisting of two portions each hinged to a central bar so as to open downwards. The object in view is to deposit stones on the spawning bed coated with fertilised ova. To do this the tray is placed in the tub, which is then filled with sea-water. Into the tray a number of flat stones are arranged; the water is then fertilised and the stones coated with eggs. This done, the tray is lowered to the bottom by means of four cords—two attached to the rim of the tray, and one to each half of the bottom. When the tray has reached the sea-floor, the cords attached to the false bottom are set free, and the tray raised by the cords attached to its edge, the result being that the egg-coated stones are left at the bottom. By this method the fishermen, without any trouble or expense, could add 200 or 300 eggs for every herring they removed from the sea, and thus do their best to restore the balance of nature which their operations had disturbed.

PARIS

Academy of Sciences, March 17.—M. Rolland in the chair.—On the new map of Tunis to the scale of 1 : 200,000, now being prepared in the French War Office, and the first six sheets of which have just appeared, by M. F. Perrier. The map, which will be completed early next year, will comprise twenty sheets altogether, uniform with that of Algeria, of which it forms a natural continuation.—Relative rapidity of combustion of explosive gaseous mixtures, by MM. Berthelot and Vieille.—On the solution of a very extended class of equations in quaternions, by M. Sylvester.—Notice of the labours of the late M. Sella, Corresponding Member of the Section of Mineralogy, by M. Daubrée.—Notice of the second volume of the Emperor of Brazil's "Records of the Rio de Janeiro Observatory," by M. Faye.—Remarks on a note by Sir Richard Owen on the discovery of a mammal (Tritylodon) in the South African Trias, by M. Albert Gaudry.—Application of the incandescent lamp for the lighting of astronomical instruments, by M. G. Towne.—Remarks on the shadows cast by the faculæ on the penumbra of the solar spots (one illustration), by M. E. L. Trouvelot.—On some arithmetical applications of the theory of elliptical functions, by M. Stieltjes.—On a new generalisation of the Abelian functions, by M. E. Picard.—On the thrust of a mass of sand with horizontal upper surface against a vertical or inclined wall, by M. J. Boussinesq.—Theory and practical formulas of magneto-electric machines with alternate currents, by M. Félix Lucas.—Note on Hall's electro-magnetic phenomenon, by M. A. Leduc.—On the laws regulating the decomposition of salts in water, by M. H. Le Chatelier.—Note on the action of chloruretted aldehydes on benzine in the presence of chloride of aluminium, by M. Alph. Combes.—On the addition of chloride of iodine to monobromuretted ethylene, by M. Louis Henry.—Note on the dialysis of the acid of the gastric juice, by M. Ch. Richet.—Distribution of the motor roots in the animal muscular system, by MM. Forgue and Lannegrâce.—Memoir on the relations between plants and the nitrogen consumed by them, by M. W. O. Atwater.—Note on the cultivation of the sedimentary matter brought up from great depths by the dredgings of the *Travailleur* and *Talisman* during the expeditions of 1882-83, by M. A. Certes. The object of these experiments is to show that the absence of plants or animals in decomposition at the bottom of the sea is probably due to the presence of microbes analogous to those which, under our eyes, are daily working at the transformation of organic into inorganic matter.—On the renal organs of the embryos of Helix, by M. P. de Meuron.—On spermatogenesis and the phenomena of fecundation in *Ascaris megalocephala*, by M. P. Hallez.—On the Simœdosaurian, a reptile belonging to the Cernay formation of the Rheims district, by M. Victor Lemoine.—On the morphological value of the cortical libero-lignose masses in the stems of the Calycantheæ, by M. Oct. Lignier.

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